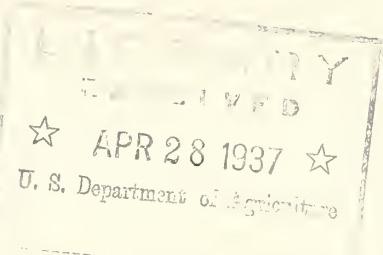


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## THE WEATHER BUREAU OF THE U. S. DEPARTMENT OF AGRICULTURE

A radio dialogue by Mr. Donnell, Chief of the Chicago forecast center of the Weather Bureau, U. S. Department of Agriculture, and Miss \_\_\_\_\_, Chicago high school student. Broadcast over Station WJJD on Monday, April 26, 1937, at 2:15 p.m., in the Future Citizens series sponsored by the Business and Professional Women's Club, Chicago.

--ooOoo--

MR. DONNELL:

I'll try to answer your questions, Miss \_\_\_\_\_, but don't make them too hard. You know there are some things about the weather that still puzzle us.

STUDENT:

Such as how to make it rain?

DONNELL:

Yes, that's one thing we can't do.

STUDENT:

Well, I'm not a scientist, Mr. Donnell, but I certainly know how to make it rain.

DONNELL:

I've seen a good many kinds of rain-making contraptions. The trouble is, they don't work. But what's your method?

STUDENT:

Oh, it's simple. I just plan a picnic. Of course you're more likely to get a good, hard, drenching rain if you've invited a lot of people, and made dozens of sandwiches.

THEORY OF THE STATE, INSTITUTIONS, AND POLITICAL POWER

THEORY OF THE STATE, INSTITUTIONS, AND POLITICAL POWER  
BY  
JAMES C. COOPER  
UNIVERSITY OF TORONTO  
1970

DONNELL:

Now we'll have to look into that. Suppose you do the research, Miss \_\_\_\_\_, and we'll have you prepare a paper on "The Picnic as a Causative Factor in Heavy Precipitation."

STUDENT:

All right. I'll begin my research next month. May is a grand month for picnics. But while you're waiting for my scientific contribution, will you tell us about the Weather Bureau? Has it always been in the Department of Agriculture?

DONNELL:

No, not always. For a good many years before 1870, people interested in meteorology -- or the science of the weather -- tried to persuade Congress that what this country needed was an organized, systematic effort to warn the public of approaching storms. There was so much agitation for weather forecasts that Congress finally passed laws, in 1871 and 1872, providing for a forecasting service, under the War Department. In 1890, the service was transferred to the Department of Agriculture.

STUDENT:

I know the Weather Bureau does a great deal more, nowadays, than just make forecasts. What are some of its other duties?

DONNELL:

Well, the Weather Bureau issues storm and flood warnings, and collects marine intelligence for the benefit of commerce and navigation; it reports temperature and rainfall conditions for the cotton and grain interest; issues frost, cold wave, and other weather advices. . . .



STUDENT:

All I know about the weather is what I read in the papers -- or hear on the radio. I always get the weather forecast before I leave home in the morning, so I'll know whether to carry an umbrella.

DONNELL:

And sometimes you carry an umbrella, and it doesn't rain -- and then you blame the weather man for being a poor guesser.

STUDENT:

Yes, and sometimes you forecast "Fair and Warmer" and it rains -- and I'm caught without an umbrella! But that doesn't happen very often. I believe you're usually right.

DONNELL:

Thank you. As a matter of fact, our forecasts are correct between 85 and 90 percent of the time.

STUDENT:

That's a pretty good average, all right. Mr. Donnell, how do you make daily forecasts, for every part of the country?

(Continued)

After a short time the patient was fully conscious.

DONNELL:

Well, we base these daily forecasts upon simultaneous observations of local weather conditions, taken every day, at 7:30 in the morning and 7:30 in the evening, 75th meridian time, at more than 300 regular observing stations in the United States, Canada, Alaska, and the West Indies. We supplement these observations with reports from other countries, and from ships at sea. Each Weather Bureau Station is operated by one or more trained observers, in charge of barometers, thermometers, wind vanes, rain and snow gages, and other devices which make a continuous automatic record of local weather conditions. Now, as I've just said, weather observations are taken twice a day, at some 300 regular stations. The results of these twice-daily observations are immediately telegraphed to the central office in Washington, D. C., and other forecast centers, where they are charted and studied by experts trained to forecast the weather conditions that may be expected to prevail during the next 36 to 48 hours.

STUDENT:

You say the central office of the Weather Bureau is in Washington. Where are the other "forecast centers"?

DONNELL:

In New Orleans, Denver, San Francisco, Jacksonville, and Chicago. Both morning and evening forecasts are prepared in these cities.

STUDENT:

Which States are in the Chicago territory?



DONNELL:

Illinois, Indiana, Michigan, Wisconsin, Missouri, Iowa, Minnesota, North Dakota, South Dakota, Nebraska, and Kansas. Within two hours after the morning observations are taken, forecasts are telegraphed from the six forecast centers to nearly 2,000 distributing points. Then they're sent out by mail, telegraph, telephone, and radio.

STUDENT:

Weather forecasts by radio must be a great help to farmers.

DONNELL:

Yes, to farmers and to livestock men. They want to be warned a long time in advance, when a frost or a cold wave is on the way. Or a flood, or a heavy snowstorm. Radio stations cooperating with the Weather Bureau broadcast weather forecasts at least once a day, sometimes several times a day. You're a student, Miss \_\_\_\_\_, you'd be interested in our weather library in Washington. We have about 50,000 books and pamphlets.

STUDENT:

Just about the weather?

DONNELL:

Yes, just about the weather.

STUDENT:

Well, there's one thing I'd like to know -- maybe you can tell me without consulting your library -- what's the coldest weather ever recorded?



DONNELL:

In the United States?

STUDENT:

Yes sir.

DONNELL:

The all-time low record for the United States is 66 degrees below zero. That was reported just four years ago last February, from Yellowstone Park.

STUDENT:

What is the coldest weather ever recorded in the world?

DONNELL:

The world record for cold weather? I believe that's 90 degrees below zero, reported from northern Siberia.

STUDENT:

Ninety degrees below! That will be something to think about, in the middle of the summer. Mr. Donnell, do you think that our climate is changing -- that we're going to have dust storms every few years, from now on?

DONNELL:

Do you think, Miss \_\_\_\_\_, that dust storms are something new?

STUDENT:

Well, I never heard of them before the past few years.

DONNELL:

We've had dust storms for thousands of years. Every time there's a lack of normal rainfall, in certain limited spots in the West, we have dust storms.



STUDENT:

But surely we're learning what to do about weather -- at least how to prepare for droughts.

DONNELL:

Yes, we learn by past mistakes. If we can restore the original natural conditions, in the Plains region, the next drought won't be so hard on us. Next question?

STUDENT:

My next question is about storm warnings, on the coast. Very important, aren't they?

DONNELL:

Yes indeed, especially for shippers on the Lakes and on the coast. The Weather Bureau displays storm warnings -- flags by day and lights by night -- at more than 400 points along the Atlantic, Pacific, and Gulf Coasts, and the shores of the Great Lakes. Ships at sea receive these warnings by radio. Our storm warning service has become so nearly accurate that for years we've been able to forecast all bad storms 12 to 24 hours in advance.

STUDENT:

Do "all bad storms" include hurricanes?

(Continued)



DONNELL:

Yes, they include the hurricanes that sweep along the Gulf and Atlantic coasts. In forecasting hurricanes, reports from the West Indies and from ships in nearby waters are especially valuable. Warnings displayed for a single hurricane have held in port, on our Atlantic Coast, ships and cargo worth over 30 million dollars. . . . Warnings of cold waves, frosts, and freezing weather are also of immense value, especially to fruit, sugar, tobacco, cranberry, and vegetable growers. Citrus-fruit growers in Florida and California save millions of dollars by heating their orchards on receipt of frost warnings. And cold-wave warnings save money for sheep and cattle men in the Northwest, and for shippers of perishable goods here in Chicago. Next question?

STUDENT:

It's about floods. How far in advance can you forecast a flood?

DONNELL:

That depends on the locality. In flashy streams -- those that rise and fall rapidly -- sometimes only a few hours notice is possible. In larger streams -- in the lower Mississippi Valley, for instance -- we can forecast a flood two or three weeks or even a month in advance. The Weather Bureau has a well-organized River and Flood Service.

STUDENT:

How far ahead did you forecast the flood we had in January?



DONNELL:

Well, on January 26, the Weather Bureau forecast the crest stage at Memphis as approximately 50 feet, to occur on February 7. The actual crest was 50.3 feet, on February 9. We missed by three-tenths of a foot, and two days. But in New Orleans, the flood crest has been forecast a month in advance, with an accuracy of one- and two-tenths feet. Flood warnings are indispensable to people who live along the rivers. Such warnings give them a chance to move livestock, harvested crops, and other property from bottom lands. But most important of all, flood and river warnings give the people a chance to leave a dangerous region, before the waters rise.

STUDENT:

Do you think we'll have any more disastrous floods?

DONNELL:

Well, records show that floods have occurred at irregular periods for many centuries. A flood is one of those "acts of Nature" which we cannot altogether prevent. However, we can take measures to minimize the disastrous effect of a flood, and to control the flood waters. Incidentally, just last month the Weather Bureau appointed a hydrologist -- an authority on waters -- to head the River and Flood Division. Eventually we intend to have a smooth-working river and flood service for every important river basin in the United States.

Now what's your next question, Miss \_\_\_\_\_?

STUDENT:

Next, I'd like to know how you forecast weather for aviation.

Do you use airplanes?



DONNELL:

Yes, we take observations of the upper air by means of air-planes and balloons.

STUDENT:

How far up do you go -- to take observations?

DONNELL:

Well, our pilot balloons, which indicate the direction and velocity of the wind, sometimes go as high as nine miles.

STUDENT:

You mean just the balloon itself goes that high!

DONNELL:

Oh yes -- we don't go along with the balloon. When observations are made at night, a small paper lantern is attached to the balloon. Inside the paper lantern is a lighted candle, or a small electric light. At night we can follow the light, instead of the balloon. . . . Then we have ceiling balloons, to determine the height of clouds, and sounding balloons, with an instrument attached for recording temperature, pressure, and humidity, at heights of 10 to 12 miles -- sometimes even twenty. The sounding balloon rises until it bursts, and then the self-recording instrument -- the meteorograph -- comes down with a parachute.

STUDENT:

How do you know where it's going to land?



DONNELL:

We don't. But attached to the meteorograph is a tag, asking the finder to send the instrument to the Weather Bureau office. We get back between 80 and 90 percent of the instruments sent up. They usually land within 50 miles of the station.

STUDENT:

But then you can't get the information right away.

DONNELL:

No, not for several days. That's why we use airplanes, to get information we want immediately. Airplane observations are made at 4 o'clock in the morning, 75th meridian time, at some thirty stations in the United States. They're transmitted promptly to the various forecast centers. Miss \_\_\_\_\_, you might be interested in a new method of upper-air observation now being developed -- a method that has a number of important advantages over both airplanes and sounding balloons. We're experimenting now with a radio meteorograph, which we expect will take the place of both sounding balloon and airplane observations in the next year or so.

STUDENT:

How does it work?

DONNELL:

Well, this instrument is simply a small radio transmitter, weighing less than two pounds. It is sent aloft, attached to a balloon, and as it ascends it transmits signals which indicate the temperature, pressure, and humidity of the upper air. By means of a radio receiver, we can get these upper-air data instantly. One great advantage of the radio meteorograph is that it can be sent aloft during bad weather, when airplanes can't fly.



STUDENT:

And that's just when you need these observations most.

DONNELL:

You're right. Another advantage of the radio meteorograph is that it gives us data up to the stratosphere, whereas airplanes are limited to about 15,000 feet, which is approximately only half way to the stratosphere. With the information we can get from a large network of stations, by means of the radio meteorograph, we hope we'll be able to predict the weather more accurately, and for longer periods, than is possible now.

STUDENT:

I suppose you make special forecasts for aviation.

DONNELL:

Yes, every six hours, at eleven stations. These, as well as a number of other large airport stations, are open 24 hours a day, and provide the country's federal airway system with frequent observations and advices. Before a pilot takes off he visits the Weather Bureau office, to get the latest reports of the weather along the route he's going to fly. If any sudden changes occur after he's taken off, he can be advised by radio, and if the weather's too bad, he can turn back, or change his course. . . . Any more questions, Miss

?

STUDENT:

No, that's all, and thank you very much, Mr. Donnell. And thank you, too, for giving us such wonderful weather today. Nice work.



DONNELL:

Oh, this is just a sample. Do you like it?

STUDENT:

Indeed I do! Will you take my order for about one hundred days just like this one?

DONNELL:

I'll be glad to take your order, but I can't guarantee delivery.

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